

# **THE DATAHANDLER**

D A T A B A S E      M A N A G E M E N T      S Y S T E M  
I N      M M S F O R T H

## USERS INSTRUCTIONS

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This DATAHANDLER diskette is designed to be used with the MMSFORTH V2.0 System Diskette on the Radio Shack TRS-80 Model I or Model III microcomputer system, configured with at least one minidisk drive and 32K bytes of random access memory.

These DATAHANDLER Instructions are provided as a necessary supplement to the PIMS Manual (Scelbi Publications).

\* - Starred sections of THE DATAHANDLER Users Instructions are not included in the initial package. MMS provides them at no additional charge upon receipt of the properly signed and completed pink copy of your DATAHANDLER User License Agreement (which is attached).

DATAHANDLER Version \_\_\_\_\_, Serial No. \_\_\_\_\_

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CREDITS:

The principal author of THE DATAHANDLER is Tom Dowling. Version 1.0 of THE DATAHANDLER was released in 1979, and Version 1.2 is the first one to be compatible with MMSFORTH V2.0.

MMS thanks the hundreds of DATAHANDLER users who have reported sharp edges, or suggested different applications or new features. The high level of user involvement continues to make THE DATAHANDLER an unusually powerful and flexible data base system.

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April 1980

TO PURCHASERS OF THE DATAHANDLER IN MMSFORTH:

Thank you for your order.

THE DATAHANDLER is our first commercial product running under MMSFORTH. We chose it carefully to be an unusually useful program while also demonstrating the practicality of programming in MMSFORTH. We intend it to be an important tool which will make the Radio Shack TRS-80 Model I a more serious system for the business world. We also hope it will give you the home computing power and the sheer programmer's delight that we at MMS have experienced during its design and development.

DO NOT FAIL TO COMPLETE AND RETURN THE PINK COPY OF THE DATAHANDLER USER LICENSE AGREEMENT & REGISTRATION FORM. Upon its receipt we will send you the remaining portion of these USERS INSTRUCTIONS and will list you for upgrade information and continuing support.

We do not guarantee to answer all your questions about THE DATAHANDLER without charging consulting fees. But we are going to try to support reasonable requests, to encourage knowledgeable dealers, and to discuss THE DATAHANDLER in the MMSFORTH Newsletter in response to the questions, items and articles sent in by DATAHANDLER users. Above all, we urge you to provide us with good documentation of bugs, fixes, and improvements.

Let's all make THE DATAHANDLER the data handler for the TRS-80!

Sincerely,

Dick & Jill Miller

A large, handwritten signature in black ink that reads "Dick Miller". The signature is fluid and cursive, with "Dick" on the left and "Miller" on the right, connected by a long, sweeping line.

SIGN, THEN TYPE OR NEATLY PRINT THE REST OF THE PINK COPY OF THIS FORM AND RETURN WITHIN 14 DAYS OF PURCHASE. IT IS YOUR GUARANTEE THAT MMS WILL HONOR YOU AS A BONA FIDE USER OF THE DATAHANDLER, AND IT WILL BE YOUR TICKET TO ADDITIONAL INSTRUCTIONS AND UPDATE MAILINGS ON THE DATAHANDLER.

===== DATAHANDLER USER LICENSE AGREEMENT & REGISTRATION FORM =====

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--- I UNDERSTAND AND AGREE TO THESE CONDITIONS.

User Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone Number: ( ) \_\_\_\_\_ May we give your name to other users (Y/N)? \_\_\_\_\_

Size of TRS-80 System, RAM: \_\_\_\_\_ No. of Disk Drives: \_\_\_\_\_

MMSFORTH System, Version: \_\_\_\_\_ Serial Number (first screen): \_\_\_\_\_ Date Purchased: \_\_\_\_\_

DATAHANDLER SYSTEM, Version: \_\_\_\_\_ Serial Number: \_\_\_\_\_ Date Purchased: \_\_\_\_\_

Bought from: \_\_\_\_\_

Address: \_\_\_\_\_

Comments (Interests and applications, suggestions - Use reverse side if desired.):

===== FOLD THIS FORM, STAMP AND MAIL TO =====

• . . . .

=====  
PLACE  
STAMP  
HERE!  
=====

DATAHANDLER REGISTRATION  
MILLER MICROCOMPUTER SERVICES  
61 LAKE SHORE ROAD  
NATICK, MASS. 01760

## 1.0 INTRODUCTION

THE DATAHANDLER is an interactive data base management system running in MMSFORTH on the TRS-80 Model I or Model III microcomputer system with at least 32K RAM and one minidisk drive. Without any new programming, its user can specify up to ten data fields appropriate to each particular job. Each field accepts variable length entries up to 255 characters long, and an easy adjustment adds more fields. Standard and special report formats can be output to screen and printer. It is an outstanding solution to a wide variety of personal and professional tasks such as management of alphabetic and numeric data files, including accounting and inventory. The DATAHANDLER diskette includes mail list and checking account programs with custom report commands and sample data files, both as useful products and as informative examples of other practical applications.

THE DATAHANDLER's program approach follows the excellent introductory documentation of SCELBI's PIMS manual. However, unlike PIMS and other TRS-80 data base packages written in BASIC, THE DATAHANDLER is extremely fast: typical multiple-field sorts on a 100-record file take five seconds, while look-ups take less than one second! The system and its sequential data files are exceptionally compact as well. An indexed key structure incorporates sophisticated string and value selection mechanisms including normal compares and values inside or outside a range. THE DATAHANDLER is the best professional solution for those data files which can reside in RAM: typically up to 8,000 data characters at one time for 32K RAM TRS-80's, and 24,000 for 48K RAM TRS-80's. Often, larger files can be divided into a series of subfiles for effective use.

Most computer data files for personal use will fit into THE DATAHANDLER easily, as will many professional tasks. The flexibility of its interactive program makes it the logical choice for use by non-programmers. For the professional programmer, it and MMSFORTH offer far greater execution speed than BASIC programs, while its complete source code and FORTH's structured and modular language provide the tools for rapid and accurate modification to a wide variety of custom applications.

Several MMSFORTH features make THE DATAHANDLER unusually well suited to single disk drive use: the program area of the DATAHANDLER diskette is software write-protected while the data file area is left open; and the diskette may be entirely removed once its program is loaded, to be replaced by one or more diskettes containing data only. Regularly used system configurations may be precompiled for automatic loading in five seconds.

## 2.0 FIRST TIME, ADDING MMSFORTH

Your new DATAHANDLER diskette cannot run until a properly adjusted version of the MMSFORTH Disk System is loaded first. The following instructions assume some familiarity with these MMSFORTH operations: FORMAT, BACKUP, and the Full-screen Editor. The MMSFORTH USERS MANUAL describes them in Chapter 2 and Appendices 1 and 3.

We will use MMSFORTH's CUSTOMIZE Utility to move (merge) an adjusted copy of the MMSFORTH System onto a copy of your new DATAHANDLER diskette. For safety's sake, work on a DATAHANDLER copy, not the original. (For Model III make a double-density copy: with your MMSFORTH System Diskette in Drive 0 and a formatted diskette in Drive 1, load the COPIES Utility, swap your DATAHANDLER diskette into Drive 0, press Break, 0 SDEN, 87 PBLK!, COPIES. Answer the COPIES questions with 15 for first source block, 86 14 - for #blocks, and 15 :1 for first destination block.) Before you begin the merge, consider the MMSFORTH system you want to use: size of RAM, lowest unprotected block (set PBLK to 53 for DATAHANDLER V1.2, as delivered), special disk drive capacity, etc. If your desired MMSFORTH system hasn't expanded beyond Blocks 0-14, just boot MMSFORTH, then enter CUSTOMIZE. Answer the questions appropriately (see the table on the next page), swap the DATAHANDLER diskette into Drive 0 when asked, and press Enter.

Are you using 48K RAM, or adding extra features to your MMSFORTH System? Be sure your MMSFORTH system was set accordingly, and make one change to THE DATAHANDLER to match: use the Editor to change 08 P1 in Block 45 Line 15 to 24 P1 for 48K RAM, or at least 1 less for any special system which uses extra memory. This tells the program that it has 24K RAM available for files in the 48K RAM system, instead of 8K RAM for files in the 32K system. Press shift-control-S to substitute the edited screen into the block buffer in RAM, then enter 0 PBLK ! FLUSH to write the modified block back to disk. (Later, you will precompile versions for faster loading; these will calculate the file and record areas and reset accordingly, automatically!)

That's it, you're done! DON'T FORGET TO BACKUP YOUR NEW DISK. Some of the steps described above are unnecessary for simple systems but will avoid pitfalls in special situations. Note that systems with less than 8K file size may fail to load some sample files. If so, make a standard 8K file-size system and use it to RUBOUT a few records from oversize files.

### 2.1 SOME COMMON MMSFORTH V2.0 SYSTEM CHOICES FOR DATAHANDLER

	<u>Memory Size</u>	<u>DIRectory Block</u>	<u>Lowest Unprotected Block</u>
To see present value	11 MMS 3 + ?	DIRBLK .	PBLK ?
32K RAM, not precompiled, File Directory at Block 53.	-16384	15	53
48K RAM, not precompiled, File Directory at Block 53.	-6 (Model I) 0 (Model III)	15	53
48K RAM, precompiled, File Directory at Block 21 after precompiling.	-6 (Model I) 0 (Model III) (For instructions on precompiling see Section 10.0.)	21	21

### 3.0 USING THE PIMS MANUAL AND SAMPLE DATAHANDLER FILES

Now that your MMSFORTH system is aboard THE DATAHANDLER, let's try it out. Its basic reference text is the PIMS (Personal Information Management System) manual, by Madan Gupta and from SCELBI Publications. It is available from MMS and many of its dealers. Read the manual and try its simple examples. THE DATAHANDLER is an original program by MMS which supports the PIMS operations and lots more, with far greater speed and capacity.

\*\*\*\*\***IMPORTANT**\*\*\*\*\*

Mount the diskette in Drive 0 and boot. Read your MMSFORTH version and serial numbers from the screen and transfer them to your DATAHANDLER USER LICENSE AGREEMENT & REGISTRATION FORM - the pink copy for MMS and the white copy for your own records. Enter DIR and copy to both forms your DATAHANDLER version and serial numbers from the DATAHANDLER DIRectory screen. THEN COMPLETE THE PINK COPY AND MAIL IT TO MMS to get the second part of this DATAHANDLER instruction manual!

\*\*\*\*\***IMPORTANT**\*\*\*\*\*

Having already booted and entered DIR to display the first screen of THE DATAHANDLER, now enter the word DATAHANDLER and wait one minute for its 36 blocks of source code (V1.2) to load and compile. (The second part of this instruction manual describes the MMSFORTH precompilation process which reduces routine start-up to a single, 5-second operation! With a precompiled DATAHANDLER, you will just boot and enter DATAHANDLER .) When DATAHANDLER is loaded, enter 2 and then CHECKS to load the CHECKS file into RAM.

To speed your introduction to THE DATAHANDLER, four sample user files are supplied. Familiarize yourself with these and then with short file creations of your own, to avoid false starts on your own major applications of THE DATAHANDLER.

CHECKS is a personal checking file which can be used with the general DATAHANDLER commands. MMS has also provided a special report function, CHECK, to summarize this file's contents to printer and/or screen. MMS-MAIL-1 is a modified version of an actual portion of an MMS customer file; it contains more data fields than the Radio Shack Disk Mailing List program and runs much faster. In addition to the LABELS report in PIMS, there is a new MAIL report which creates more appropriate mailing labels.

To experiment with the CHECKS file which was just loaded, first read its introductory notes in the FILE DESCRIPTOR which loaded with it. (Entering DESCRIPT will bring these notes back later.) Entering LIST, then A, will permit you to scan the entire file. Press the space bar to display the next record. Hold it down longer to scroll ahead rapidly, or press BREAK to abort an incomplete operation.

Now try some fancier operations. To sequentially display each record in which the payee name has A as its second character and H as its fourth character, enter in turn: LIST, M, 3, S, L, ?A?H . (The ? character is used as a "wild card", for a position where "anything goes".) To find the sum of all BAYBANK payments in the file, enter SUM, 4, M, 3, S, A, BAYBANK one at a time in response to DATAHANDLER's queries. To list those checks issued having values between \$25.00 and \$50.00, try LIST, M, 4, V, R, -50, -25 . (Note that the checks are entered as negative amounts and deposits are positive.) Run the CHECK routine for a summary report of All; while still in COMMAND? mode. To send all output to the printer as well as to screen, enter PRINTER CHECK NO-PRINTER . (Answer "INITIAL BALANCE ?" with a null entry since this file happens to include the balance as its first record.) Remember to toggle the output back to screen only, with NO-PRINTER.

Create a different report format by entering REPORT, Y, N, 3, N, Y, 2, N, Y, 1, N, Y, 4, N, Y, 5, N, Y, 6, N, N, R, 10, (null entry) in response to the screen queries. You can pause the scrolling display with a shift-@, then resume with any regular key. After observing the report output, modify the REPORT parameters by entering RFMT and changing MFS to 10, L/P to 6 and #/P to 5 . REDO and P to see the changes. (It had been initialized to print 60 lines on a 66-line page format, and you just reset that to print 5 lines on a 6-line "page", on the CRT.) Then SORT on Field 3 and again REDO and P . To REPORT only those records which have comments: REDO, M, 6, V, >, (two spaces) . REDO and P cannot follow certain items logically, but if such a problem occurs they can be reentered after a LIST or similar operation. Remember that REDO repeats the preceding REPORT format and P repeats the previous selection mode for some modes: All, Match or Non-match.

GET the much larger MMS-MAIL-1 file and try similar actions with it. (Enter the GET command, then respond MMS-MAIL-1 to its prompt.) Use RUBOUT and Non-match to reduce this file to Massachusetts records only. Here are two ways to do it despite the city/state combined-field format:

- 1) "space MA" will find all the required records, but could also include "EAST MADISON WI", for instance.
- 2) Your (U.S.) Post Office sells a ZIP CODE DIRECTORY which shows first-digit coding for U.S. regions and first-three-digit zip codes for individual states - it lists Massachusetts as 012 through 027. Overlap to other states still is possible (some post offices deliver across state lines), so you may wish to check and RUBOUT occasional "stragglers" as necessary.

Canadian zip codes, with 6 alphanumeric characters plus a central space, other foreign codes, and new 9-digit U.S. zip codes can be handled with equal facility. In fact, any DATAHANDLER field may have up to 255 characters!

Now let's use this reduced file to create a custom report. REPORT by record-number, name, city/state and phone number for All.

Then SORT them by name, and REDO, Previous. For a hard-copy print-out, RFMT LSZ=80 or the number of characters per line for your printer, L/P=66, and #/P=60. After testing (REDO, Previous) with PTR=0, note that MFS is clipping the phone numbers (among other things). RFMT MFS=20, test again and adjust until as desired, then RFMT PTR=1 and REDO for your print-out. Notice that, unlike the PRINTER command, RFMT's PTR prints only the table itself. Toggle back from it by resetting PTR=0.

Re-SORT by zip code and display this grouping with MAIL. After checking on screen, you can use the PRINTER mode to actually print the labels. On many printer/cable combinations, the power and/or select switches can be used in conjunction with the PRINTER command to enable and inhibit the print-out.

Now deactivate the on-line print-out with NO-PRINTER and the REPORT format with RFMT, PTR=0 . ADD a few more sample entries to the end of this reduced mail list. Just press the Enter key to leave a field empty, key in the text of your choice, or duplicate the preceding entry for that field with a semicolon (;). (The latter is great for repeat entries of today's date, etc.) Remember to key in STOP as the next entry when you are done adding records. LIST, All to scan the records and pick a record number to modify; do it with CHANGE, All, One, and its record number. Modify several lines and then REDO, Previous to review your work. Then change all instances of Code T to Code X with CHANGE, O, 8, M, 8, S, A, T . Then swap X for T, retaining any other character present. SAVE this file as "MY-TEST" and note how quickly it is done. After trying a GET, etc., KILL this practice file.

Although these added files and report commands are available for your use, don't miss the main point. They are examples of the kind of files, and new DATAHANDLER commands in MMSFORTH, which will make THE DATAHANDLER your own professional data base management system. You can easily create a few of your own files and add them to the existing file directory. (To do so, use END to return to the first screen.) Once you understand FORTH, your own new commands can be merged with those in the DATAHANDLER programming in Blocks 17-50. Watch the MMSFORTH Newsletter for good articles on DATAHANDLER applications and modifications. If you wish, MMS can assist you on a consulting basis.

## 4.0 DATAHANDLER COMMANDS

### 4.1 GENERAL

During DATAHANDLER operation, just type HELP to get an alphabetic listing of the available commands. Here they are ordered according to function:

Record(s) operations in RAM: ADD, CHANGE, LIST, RUBOUT, SEARCH (LIST), SORT, SUM, SUMALL.

File operations: DIR, END, GET, KILL, NEW-DIR, SAVE. Also, DIR-INIT is an option to DATAHANDLER on the disk DIRectory which is displayed at boot. It only is used to create a new type of files data block, and is explained in the second part of this instruction manual.

Report generators: CHECK, LABELS, MAIL, REPORT (with REDO and RFMT).

File parameter displays: DESCRIPT, FIELDS, FREE, HELP, MEMORY.

Output switches: PAUSE & NO-PAUSE, PRINTER & NO-PRINTER.

There, isn't that easy? In THE DATAHANDLER, record operations query you for a one-letter choice of the appropriate mode: on All records in the file, One, a Range, only those which fit or miss a certain Match, or the same choice as in the Previous run. (On Range, a null entry will enter the extreme limit. On One, a null entry will select the final record.) On Match or Non-match, you are queried for the match field. Whether the field is alphanumeric or numeric, you may do a String or Value match. If Value: equal to, greater than, less than, or a range? Then, what string or value is to be matched? If String: Perfect match, Any internal partial match, or only a Leading (leftmost) partial match? The ? symbol may be used to represent ambiguous ("wild-card") characters at specific positions within the string of characters to be selected.

These queries are one of the sources of THE DATAHANDLER's great additional power compared to PIMS and most other microcomputer data base management systems. To learn their use, just use them and your imagination until you can call special operations in seconds!

The All, Match, and Non-match options may be repeated even faster and more easily with the Previous option. In Version 1.2 the Previous operation may be used across multiple disk files which have identical file structure definitions.

If your practice sessions result in blunders, just GET the file back from disk in seconds to start over.

#### 4.2 COMMANDS TABLE

The following comments supplement the information in the PIMS manual.

##### ADD

Like many other commands, ADD incorporates features beyond PIMS. If you are adding several records and wish to duplicate the same field entry that was in the prior record entered, just enter a semicolon (;). To back up to the prior line of the present record, enter a minus sign. As in PIMS, say STOP to stop adding new records.

##### CHANGE

also has new features. You can use a minus sign to leave a field unchanged (as in PIMS); however, now a null entry will do the same. (To blank the field, enter one or two spaces.) Now a selected batch of records can be changed in a single operation, on one field or all. If you are changing several records and wish to duplicate the same field entry that was in the prior record changed, just enter a semicolon (;).

##### CHECK

is an example of a custom report generator command written in MMSFORTH for use within THE DATAHANDLER. It summarizes each record in the CHECKS file, plus a running balance, as one line on printer and/or screen.

##### DESCRIP

is a new command to review introductory text which may be provided at the beginning of each file. This text is created at the beginning of the new file sequence, following the "FILE DESCRIPTOR:" heading on screen. It can be as short or long as you wish, ending when you enter a null line. (For a blank line, just enter a space instead of a null.)

##### DIR

reads and displays the current file directory. As delivered, it is on Block 53 of the diskette in Drive 0.

##### END

clears the present file and returns to the DATAHANDLER front screen. But first it asks if you really mean it. Say no (N) and it bails you out, perhaps to SAVE the new version if that's important.

##### FIELDS

reviews the field numbers and allocations in each record of the file presently in RAM. Instead of the 4-letter field names of PIMS, DATAHANDLER allows 8 characters of your choice. (It is easily modified for more.)

**FREE**

reports on the remaining diskette space for additional files.

**GET**

overwrites the present in-RAM file with the one you specify to its "FILENAME=?" query. SAVE first, if you wish to keep the latest modifications!

**KILL**

can be deadly! As in DOS, it kills a file from the file directory. (But unlike DOS, AFTER asking you for the FILENAME.) If the file also is in RAM at the time, that copy will remain.

**LABELS**

still performs as in PIMS. Structure the first five fields of your file appropriately if you intend to use it.

**LIST**

now is the most common command, as it also incorporates the SEARCH function from PIMS. You can use it to review All of the file after you GET it, to confirm a correct load. Just keep the space bar depressed to "riffle" through many records. Because they all display in the same screen locations, you easily can watch one field to see if it is riffling in random or sorted order. Break when you wish, and re-LIST for any individual or group of records selected on your choice of conditions.

**MAIL** *Set printer at 17 L+H margin & Emph mode.*

is a new example of special report commands in MMSFORTH. It was written specifically to create mailing labels of up to five lines based on the file structure in our MMS-MAIL-1 example. MAIL will work with FIRSTNAME LASTNAME format, but if it finds a comma in the field it presumes LASTNAME,FIRST with no space after the comma -- it will assume one was intended, thereby allowing each record to save one field space. The latter format is normally preferable because it aids selection and sort by last name. MAIL assumes five lines on each printer label and one extra line feed between (unless LABEL-HEIGHT is changed from 6), prints Fields 1-6 after combining Fields 5 and 6 into a single line, compacts out internal blank lines and then relocates them between labels. Unlike most DATAHANDLER routines, it assumes NO-PAUSE in its display because it is usually used on a printer. (Enter PCRT MAIL CRT to avoid page feeds during print-out.) You can pause MAIL using the shift-@, and can continue with any other key.

**MEMORY**

displays the remaining RAM available for new records in the active file, as the approximate number of additional records based on the present average record size. Leave some space for future expansion of existing records. NOTE - THE DATAHANDLER automatically protects against oversize files, and will refuse to process them for you.

**NEW-DIR**

permits changing to a new file directory. This is useful for cases such as loading THE DATAHANDLER and then trading for one or more other diskettes. These may have files only aboard, in which case the directory would probably be in Block 0 on Drive 0 or Block 179 on Drive 1, etc. (If you will be saving files on block numbers lower than 53, reset PBLK accordingly.) One directory can handle multiple diskettes if desired. The MMSFORTH and DATAHANDLER programs reside in RAM and do not require their own diskette to be present, once loaded!

**IMPORTANT:** ALWAYS use NEW-DIR when swapping disks during a DATAHANDLER session, to warn your computer that the new files no longer are at the prior DIR's disk locations!

**PAUSE and NO-PAUSE**

switch whether a series of record displays will halt at the end of each record or will scroll continuously. PAUSE is the default mode at start-up. NO-PAUSE is normally selected when outputting to a printer.

**PRINTER and NO-PRINTER**

switch the use of the optional printer, and are similar to the MMSFORTH words PCRT and CRT. NO-PRINTER is the default mode at start-up. Note that MMSFORTH provides the video display in conjunction with its output to printer. PRINTER prints the screen queries and responses as well as the report. The alternative REPORT command, using RFMT's PTR=1, only prints during the REPORT and thus usually is a preferable approach for final report generation. (Programming note: PRINTER filters out most control codes and converts the PAGE instruction to CR for the printer, while PRINT and PCRT do not.)

**REDO**

permits a repeat run of the REPORT command. It commonly is used to repeat a REPORT output after resetting one or more of the RFMT parameters; i.e., RFMT, PTR=1 Enter, Break, REDO, P for hardcopy output of a properly adjusted REPORT output.

**REPORT**

adds flexible report formatting without Forth programming! The standard REPORT format prints all fields in order across one or more lines as required, allotting the maximum number of characters used for each field up to 255 each. Or you can specify your own number, choice and sequence of fields to be printed. Either option can be modified extensively using the RFMT parameters, and can be recalled with REDO.

**RFMT**

allows you to adjust the REPORT formatting parameters. These will be displayed one at a time with their present settings for you to change, or to leave as is with a null entry. They are: PTR, printer on/off (1 or 0); MFS, maximum field size (1 to 255); LSZ, line size (you may wish to set this to 80 to fit a standard printer, rather than 63 for the CRT); S/F, blank spaces between fields; L/R, blank lines between records; IND, indentation spaces for all except first line of each record; L/P, total lines per page; #/P, # of printed lines per page.

**RUBOUT**

now can be used to delete records from a file based on selective matches or non-matches, etc. It is a powerful new technique to create a special purpose file from a larger one, or to do the equivalent of a multiple-field selection operation on the temporary file data in RAM.

**SAVE**

your file to the current file directory. Answer its "FILENAME?" query with a file name of up to any thirteen characters. If you have oversize files, -- don't! Save them as multiple subfiles with descriptive names such as MAIL/A-F to make life easier.

**SEARCH**

is now just a synonym for LIST. It still works, so the PIMS Manual remains accurate as an introductory subset of THE DATAHANDLER.

**SORT**

is one of the most powerful tools in THE DATAHANDLER. It can perform surprisingly fast multiple sorts on up to ten fields. Get used to its flexibility and compare its speed with PIMS and other TRS-80 tools of this, ahem, sort?

**SUM**

did an intelligent sum on any single numeric field in PIMS; its IQ is higher still in THE DATAHANDLER. Exercise it on our sample files and your own to develop expertise in its uses. You may prefer its partner, SUMALL, for most use.

**SUMALL**

is a powerful variation on SUM. Like SUM, it only works on those records which you have selected - but it automatically sums each of the numeric-format fields during a single pass. Use it on files in which you allocate multiple fields to, for instance, several categories of expense. Sum simultaneously within each category with SUMALL.

## 5.0 USING MMSFORTH WORDS & OPERATIONS WITHIN THE DATAHANDLER

In strict terms, one does not write programs in FORTH. Rather, one merely extends the instruction set to include new words defined in terms of the preceding ones. Thus THE DATAHANDLER is just a collection of additional MMSFORTH words. Understanding this, you can take advantage of the end of each DATAHANDLER routine - the COMMAND? display which is equivalent to Forth's normal ok - to do other MMSFORTH activities before the next DATAHANDLER activity. For example, you could do some RPN math at this point, or even write a string of single-entry DATAHANDLER commands. Hitting the shift-@ keys at any point pauses the routine; hit any key to resume. The BREAK key aborts an uncompleted routine and returns to COMMAND? . (Note: MMSFORTH ignores a second use of the Break key unless another key is pressed first.)

Most MMSFORTH operating features are also available to enhance THE DATAHANDLER: auto keyboard repeats, adjustable cursor parameters, etc. With MMSFORTH V2.0 and Model III or Model I with Radio Shack's keyboard unit modification, upper/lower case compatibility also exists - just use shift-0 to toggle between the two modes. In most other programs, when the same words occur as upper case or lower case entries they are treated as two separate words. However, THE DATAHANDLER is delivered with an optional select mode preset to treat them identically. (See ?UL , in Section 11.2.)

Not all MMSFORTH words are available. Upon loading, THE DATAHANDLER will FORGET \* . Thus, \* , / and \*/MOD , etc. plus the Editor are unavailable. (But instead of n1 n2 /MOD one can use n1 0 n2 U/MOD, etc.) Some other words, such as LIST and DIR, have been redefined in THE DATAHANDLER.

## 6.0 UPGRADES FOR THE DATAHANDLER

MMS reserves the right to modify DATAHANDLER programming and documentation at any time to add features or to enhance the performance or description of existing ones. As a result of this continuous development policy, new features may appear "prematurely" in your software or documentation. MMS welcomes brief questions on such items and may comment further in the MMSFORTH Newsletter.

Inexpensive upgrades to the latest version are available from MMS whenever you wish, as rewrites on your original (MMS-labelled) DATAHANDLER (or MMSFORTH System) diskette. As of this writing, the upgrade service is available at \$10.00 per item plus \$2.00 shipping/handling (U.S. and Canada). Where new versions are priced higher, the difference also will be charged. Include \$4.00 additional - this will be returned with your shipment unless your original diskette requires replacement during the rewrite operation. Put the diskette in a baggie to minimize this risk, then nest it pressure-free inside a box and mail it First Class to MMS.

## 7.0 ADDING YOUR OWN FILES FOR ONE OR MORE DISKETTES

You can create a new file by selecting Option 1 immediately after THE DATAHANDLER is loaded, or after entering END and Y if a prior file is already in RAM. You first will have the option of creating a FILE DESCRIPTOR which will be displayed upon loading of that file, and anytime after upon calling DESCRIPT. See the sample files, CHECKS and MMS-MAIL-1, for examples of its use. Then define the fields, ADD the file records, and SAVE with a new file name of as many as 13 characters. The file will be saved into the active file directory, which may have been defined to address portions of one or more diskettes.

Many users will want to use multiple subfiles of the same file specification. For example, an overly large membership list could be split into MEMBER/A-F, MEMBER/G-P, and MEMBER/Q-Z. Just one specification of file will suffice for such cases. Create the additional files by GETting the original one, then RUBOUT and All before ADDing the new file and finally SAVEing it with its new file name.